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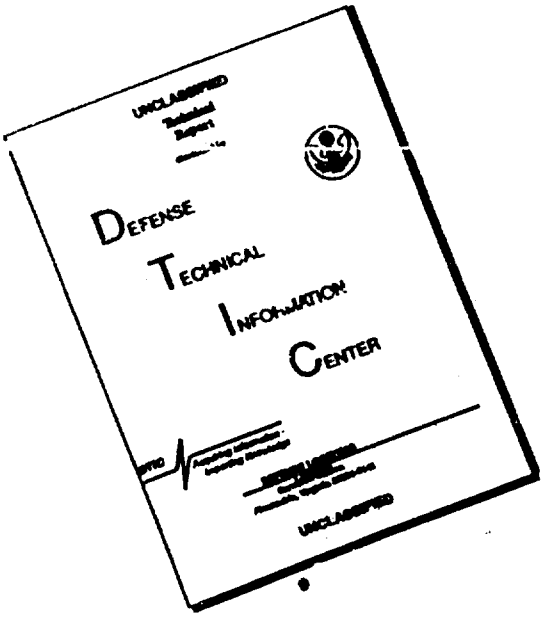


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# ON VARIOUS DISEASES IN FARM ANIMALS

- USSR -

[Following is the translation of several articles in Veterinariya (Veterinary Science), Vol 38, No 7, July 1961. Complete bibliographic information accompanies each article.]



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# CERTAIN CHARACTERISTICS OF FOOT-AND-MOUTH DISEASE IN HOGS

[Following is the translation of an article by N. A. Aleksandrov, G. K. Makhov and T. I. Chernetskiy in Veterinariya (Veterinary Science), Vol. 38, No. 7, July 1961, pp. 42-44.]

Under our conditions of fattening animals by public dining establishments, incidence of foot-and-mouth disease in hogs, the peculiar nature of this infection and the economic loss caused by it dictate the necessity of studying the methods of infection and gaining experience in carrying out preventative and sanitation measures. It is a well-known fact that one of the characteristics of foot-and-mouth disease in hogs is its direct connection with hoof-and-mouth disease in cattle. There is no doubt that other sources of infection can have an effect in an area with foot-and-mouth disease upon hog infection. In kitchen fattening establishments, where the animals are usually kept under conditions eliminating contact with local livestock, it is particularly important to trace the methods of bringing the infection, since in many cases hog infection has been observed even when surrounding villages contain no foot-and-mouth disease. On all bad farms, with the presence of hogs and cattle which have had the disease, as a rule the hogs have come down with foot-and-mouth disease. Only in one case, whereby a breeding bull which had been brought to the farm came down with the disease among cattle immune to hoof-and-mouth disease, hogs, under conditions of close contact with the diseased animal, eating the remains of its fodder, did not manifest signs of foot-and-mouth disease.

Elucidation of the methods of bringing in foot-and-mouth disease to isolated hog fattening areas, as well as to mixed farms in which at first hogs came down with foot-and-mouth disease, led to the determination of a direct dependence between outbreak of the disease with the delivery to restaurants of meat from animals in a foot-and-mouth disease environment and slaughtered at the local packing house. Without delivery of meat from the local meat combine and simultaneous lack of foot-and-mouth disease in the village, an outbreak of the disease could be connected with the delivery of frozen carcasses from distant points for kitchen processing. Waste food forming hog slop contaminated by waste meat from meat infected by hoof-and-mouth disease, most often constitute the direct source of infection. It is an accepted assumption that the muscle tissue of animals with foot-and-mouth disease and slaughtered for meat, as a result of biochemical processes during the maturation period of the carcass and with cooling

down to minus four to six degrees centigrade, the virus breaks down within 48 hours. At the same time numerous studies for elucidating the sources and methods of spread of foot-and-mouth disease indicate that raw products of slaughter retain the viable virus for a long period of time. For example, it has been proved that the meat of animals from hoof-and-mouth disease infected farms, the waste meat products and other materials after slaughter can serve as sources of infection (M. V. Revo). According to data by A. L. Skomoroknov, K. A. Popov, G. A. Makarichev and others, hoof-and-mouth infection can be introduced to farms not infected by this disease by rapidly cooled and frozen meat. It has been ascertained that if hogs susceptible to foot-and-mouth disease are fed together with bone marrow bones from diseased animals even after the bone meal has been kept at a temperature of 1.6° for 80 days, infection ensues (Andrews). Cases occur of infection being carried by slaughtered carcasses delivered after 77 days of storage (M. V. Revo). Studies by D. M. Teternik, Ye. M. Freydlin, I. S. Zel'manov and others have proved the possibility of maintaining the viable virus up to 76 days in the lymphatic glands and bone marrow of the refrigerated carcasses. In cutting up infected carcasses in kitchens, cutting up organs and bones, the still virulent virus is inevitably freed from the tissue, and this virus goes into hog feed together with the waste food from the kitchen. One must assume that such virus contamination of feed components provides massive onslaught of the pathogene into the hog's organism. The alimentary method of infection from one general source (feed) together with the massive nature of the dose of foot-and-mouth disease virus place certain features in the beginning and course of the infection on farms with hogs susceptible to foot-and-mouth disease. The delivery of infected meat from packing houses and cutting it up, as a rule lead to the almost simultaneous appearance of foot-and-mouth disease in hogs at several hog fattening points. In addition, if we consider that among animals of a herd where foot-and-mouth disease exists, clinical healthy carriers of infection exist for a long period of time (data by Ramon, Byurga, Flyukkiger, etc), the slaughter of these animals under ordinary slaughter conditions greatly increases the danger of spreading the infection through slaughter products. Due to the high infectivity of the foot-and-mouth disease virus and the massive nature of the doses of virulent material entering the organism of susceptible animals by the alimentary tract, spreading of the disease among hogs occurs quite rapidly. As a rule, within one to two days after the first isolation of diseased animals almost all hogs are clinically ill, while in cases of contact infection of hogs from diseased cattle the spread of the infection and isolation of sick animals is spread out in a longer period of time. Typical in this respect was the progress of foot-and-mouth disease infection in farms number 1 and 2 (see table). The figures in the table on the dependence between the speed of isolation of diseased animals and percentage of animals contracting the disease with the prevalence of either infection method, corresponded approximately in other farms with incidence of foot-and-

Dependence of Incidence of Foot-and-Mouth Disease Among Hogs on Methods of Infection

| Номер хозяйства а | Количество свиней в хозяйстве б | Путь заражения в | Заболело g: всего | Из них выделено по дням: 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|
| 1 | 63 | Алиментарный d | 56 | 6 10.7% | 32 57.1% | 11 19.7% | 7 12.5% |
| 2 | 22 | Контактный e | 8 | 2 25% | 2 25% | 2 25% | 2 25% |

a) Number of farm b) Number of hogs in farm c) Method of infection d) Alimentary e) Contact f) Total g) Contracted disease h) Of these, isolated by days

mouth disease. With relatively identical conditions of maintaining and feeding animals and simultaneous infection, the alimentary method of infection due to the massive doses of virus entering the organism leads to a more rapid isolation of clinically diseased animals with a greater inclusion of hogs in comparison with contact reinfection. Examining the epizootic features of foot-and-mouth disease in hogs, depending on the method of reinfection, we must note that on farms served the speed of isolation of diseased hogs and the degree of seizure by foot-and-mouth disease by the hogs on farms with incidence of disease increase from year to year. It is difficult to reliably establish the cause for this phenomenon. However, considering the proven potential of strengthening or weakening of virus strains for a specific type of animal at the basis of an increase in virulence of local strains of foot-and-mouth disease virus (type O) in hogs, apparently causes exist of an immunobiological nature. One can consider that due to the more frequent infection and greater seizure of cattle by regularly conducted active anti-hoof-and-mouth disease inoculations, the local virus strain has weakened its virulence to this type of livestock. At the same time an increase in the number of hog farms, less attention to specific prophylaxis of foot-and-mouth disease in hogs and the more frequent carrying of the virus and its adaptation to hogs constitute the reasons for the more acute and comprehensive outbreaks of foot-and-mouth disease among hogs at fattening points of public dining enterprises. Noting from year to year an increase in the number of farms with incidence of foot-and-mouth disease in hogs and an increase in economic losses, we were forced to initiate anti-foot-and-mouth disease vaccination of hogs at kitchen fattening centers, taking into consideration incidence of the disease in the surrounding areas. This measure has already proved its practical effectiveness: in many cases where the hog fattening area is completely surrounded by farms with incidence of foot-and-mouth disease and where there is delivery of meat from a local packing house deliberately infected with virus, the vaccinated hogs remained free from infection.

Conclusions

1. Observations on methods of infecting hogs at fattening centers

for public eating enterprises have indicated the necessity of introducing a stricter veterinary-sanitary regime on these stock-raising farms, introducing to hogs, with the existence of epizootic indications, prophylactic vaccination against foot-and-mouth disease with subsequent booster shot for young animals and hogs to be fattened.

2. Displacement of a fattening farm should be isolated as far as possible, and the waste food given to the hogs as feed should be boiled, preferably at the collection point. Means of transport (Carts, trucks) and packing for transferring these waste products should be regularly decontaminated. A timely and complete execution of these measures prevents the incidence not only of foot-and-mouth disease but of other contagious hog diseases in cases whereby infection of the animals is possible by means of infected waste food products and kitchen slop obtained from public dining enterprises.

# DISINFECTING ENVIRONMENT FROM ANTHRAX SPORES

[Following is the translation of an article by S. D. Belokhvostov, V. M. Pasyukov, K. V. Ryabushkin, V. S. Suvorov and A. P. Bocharov in Veterinariya, Vol. 38, No. 7, July 1961, pp. 78-79.]

Literature devoted to microbiology and epidemiology of anthrax contains a solid opinion on the high degree of stability and great length of preservation of pathogene spores in the environment. D. K. Zabolotnyy (1927), Zoberngaym (1930), Vilas and Gonzelas (1950) and many other scientists believe that anthrax spores can be preserved at various substrata under artificial and natural conditions for many years and even decades. The great stability of anthrax spores in the environment, particularly in the soil, serves as a basis for the statement by N. M. Anastas'yev (1949) on the necessity of fencing in contaminated areas and completely abstaining from their use. We believe however that for a more complete judgment on the epidemic danger of infected objects in the environment it is essential to be guided not only by the period of preservation of the pathogene but by quantitative changes in the infective properties of specific objects in time. This study had as its task an experimental study of the dynamics of anthrax spore dying off on various objects of the environment. Samples of wood, metal and cloth, as well as soils were contaminated by a suspension of a vaccine strain of anthrax spore (STI) with 60-80 billion microbe cells per square meter of object surface. Some contaminated objects were placed in the sun, others in the shade. The experiments were conducted in the spring, summer and winter at air temperatures of +28 to -14°. The methods of taking and studying the samples consisted in the following. From each sample of contaminated fabric two 5x5 cm squares were cut, which were placed in 25 ml bottles of distilled water. Two 10x10 cm square samples were taken from the contaminated surface of wood or metal. The square was rubbed by two sterile cotton wads: at first moist and then dry. Both wads were placed in 10 ml bottles of distilled water. The bottles were shaken for five minutes on a vibration unit. From the outwashes seedings were made of 0.3 ml of liquid or its culture (from $1:10^2$ to $1:10^5$) to nutrient agar into three bacteriological dishes. These were kept in a thermostat at a temperature of 34-37° for four days. The soil (sandy loam, covered by thin grass vegetation) was studied one year after contamination, for which soil samples from sectors of 25 square cm were taken with sterile metal scoops at a depth of up to 1 cm. The samples were placed in 75 ml flasks of distilled water;

after careful shaking 0.3 ml of suspension each was placed on three dishes with agar. The study materials showed that on the samples of cloth contaminated in the winter (in February) and submitted to solar radiation, the density of infection had decreased by 72 times in three months (from 240,000 to 3,340 microbes per sq cm). A month later the number of microbes was about 500 per sq cm, and in July, six months after the beginning of the experiments, contamination decreased to 360 microbes per sq cm, a decrease of 670 times from the starting point. In experiments begun in April on the same sample of cloth, the spores died off much more intensively, and in three months (from April to July) the number of microbes decreased from 1.2 million to 105 per sq cm, by 11,400 times, and in six months -- to 15 microbe bodies per sq cm. The decrease was even more noticeable on the cloth contaminated in June.

On the cloth test objects kept in the shade spores died off under analogous test conditions much more slowly. Even after ten months the quantitative decrease was noted on a comparatively small scale: from 402,000 to 18,000 microbes per sq cm. Natural decontamination of the surface of unpainted wood was studied in three sequential experiments, which were begun at the same time as the previous studies. Rather rapid autodecontamination occurs on wood surfaces which are open and accessible to sunlight. For example, in the experiment begun in April, ten days after the controlled infection, spores decreased by 85,000 times, and after 60 days it was zero. On the same surfaces left in the shade, five months after the beginning of the experiment as many as 30 to 60 spores were found per sq cm.

Natural decontamination of unpainted sheet steel surface kept out of the shade occurred relatively rapidly as well. One month after the beginning of the experiment single spores were found per sq cm (decrease in comparison with initial concentration was more than 300,000 times), and after two months a complete absence of spore microorganisms was observed. On the shaded surface of steel a noticeable decrease in contamination was noted only after three to four months. In experiments on sandy loam soil the nature of the dying off of spores was studied in the summer at an air temperature of 10.5-26° and relative moisture of 52-80%. Three equal sectors were chosen (3x3 m), exposed to solar radiation, and one sector shaded by a reed mat. On the exposed sectors of soil in one case the density of spore contamination decreased by 400 times in 15 days, and 670 times in 35 days (period of observation). In two other cases in similar sectors of soil only a few microbes were found in 13 days, and three weeks from the beginning of infection no spores were found. However, we should note that in these sectors the initial spore concentration was somewhat lower than in the first case. On the shaded sector the spores, all other experiment conditions being equal, remained viable for a year.

The above data indicates that natural environmental factors can lend some aid in carrying out disinfection measures, even in respect to such stable microbe forms as anthrax pathogene spores. With-

out eliminating the possibility of decreasing contamination of our objects due to planting the spores in the environment (as a result of drying, weathering), we cannot but note an extremely intensive dying off of microbes. In particular, with other conditions being equal on the objects subjected to insolation, contamination decreased by hundreds and thousands of times more intensively than in the shade. In some cases, such as on metal, the effect of solar radiation made it possible to achieve even complete decontamination of exposed surfaces. The intensity of contamination decrease depended to a great degree on the properties of the objects being decontaminated. On metallic objects the density of contamination decreased more rapidly than on wooden, and on wooden more rapidly than on cotton fabrics and cloth. However, in the majority of cases individual spores were preserved on contaminated objects for many days and even months.

## NEWS ITEMS

[Following is the translation of several short items in Veterinariya, Vol. 38, No. 7, July 1961, pp. 95-96.]

Seminar on Hog Diseases by G. F. Yepifanov

A seminar on hog diseases was held at the Siberian Scientific Research Veterinary Institute, convened by the RSFSR Ministry of Agriculture Veterinary Administration. From 18 oblasts and krays in Siberia, the Urals and the Far East, there arrived 38 veterinary physicians -- workers from oblast veterinary departments, oblast veterinary bacteriological laboratories, chief veterinarians of rayons and sovkhoz veterinarians of rayon and inter-rayon veterinary bacteriological laboratories. The participants in the seminar heard lectures by scientific workers of the Siberian Scientific Research Veterinary Institute on contagious and noncontagious hog diseases: by Honored Veterinarian of the RSFSR, Candidate of Veterinary Sciences I. V. Okuntsov -- "

"New methods of combating hog cholera and specific anti-hog cholera prophylaxis", Candidate of Veterinary Sciences Z. M. Il'ina -- "The Present State of Study of Atrophic Hog Rhinitis", Candidate of Medical Science I. Ye. Trop -- "Hog Leptospirosis", Candidate of Veterinary Sciences P. T. Lebelev -- "Noncontagious Hog Diseases and Their Prophylaxis," etc. Practical classes were held in the laboratories of the Siberian Scientific Research Veterinary Institute and at the Omsk bioplant on the pathologoanatomical diagnosis of hog cholera, on color reaction to hog cholera, precipitation reaction on agar slides in jelly, luminescent analysis of material from hogs with cholera and healthy hogs, and post-vaccination changes were demonstrated on hogs vaccinated against cholera. Classes were also conducted on infectious atrophic rhinitis erysipelis, listerellosis, leptospirosis and other hog diseases. Participants of the seminar made an excursion to front-ranking hog farms of Omskaya oblast. At the "Luzinskiy" sovkhoz the veterinarians become acquainted with the farm's veterinary service, the production of biostimulators and antibiotics, as well as with the work of the diagnostic laboratory. At the "Victor" sovkhoz, where Hero of Socialist Labor Tat'yana Pereshivko works, model pigsties were demonstrated with large-group repasturing of hogs, and the participants of the seminar became acquainted with the veterinary-prophylactic work on the sovkhoz.

Jubilee Scientific Conference by D. G. Vardosanidze

A jubilee scientific conference was held in Tbilisi dedicated to the 40th anniversary of the establishment of Soviet authority and the formation of the Georgian Communist Party. Representatives of scientific research institutions, universities, specialists and practical agricultural workers from fraternal transCaucasian republics participated in the conference. The conference was convened by the director of the Georgian Zootechnical Veterinary Academic-Research Institute, reader V. G. Mamatelashvili. Academician R. Sattarzade of the Azerbaydzhan Academy of Agricultural Sciences reported on the effectiveness of grazing simmentalized livestock in Azerbaydzhan, and Prof A. M. Akhmedov -- on the possibility of an epidemiological tie between calf colibacillosis and dyspepsia in children. Prof K. M. Safarov gave a talk entitled "Problems of Animal Leptospirosis", and reader A. K. Verdiev — "On the Origin of the Azerbaydzhan Zebu". Prof Z. Kh. Dilanyan (Yerevan) told of the mechanization of certain components in the technology of brined cheese in vats and efficiency in the method of its maturing and storage by the use of polymeric coverings. Prof A. A. Rukhkyan told of introductory crossing in the system of breeding measures for the further improvement of the Armenian semifine wooled fat-tailed sheep. Prof Ye. V. Kadilov gave a report on certain experimental-histological questions dealing with the problem of regeneration. Candidate of Agricultural Sciences N. K. Gotsiridze read an interesting paper — "Breeding the Caucasian Brown Cattle Species in the Georgian SSR". Reader G. Dzhordzhikiya reported to the conference on experiments in increasing butter-fat content of the red steppe breed by introductory cross-breeding with khevsurskiy cattle. Professors Sh. Ye. Chkhartishvili, I. F. Kvesitadze, D. A. Gelovani, A. G. Natroshvili, A. P. Kiziriya and I. A. Matikashvili also read papers, as well as readers V. G. Mamatelashvili, V. Sigua, I. Avazashvili, I. L. Lobiladze, V. P. Shamatava, etc. The conference heard and discussed 67 scientific papers at the plenary session and 4 sections, as well as addresses by representatives of scientific research institutions and universities in Georgia, Azerbaydzhan and Armenia.

Conference on Problems of Protozoology by A. A. Aliverdiyev

A conference of workers from scientific research institutions, universities of Azerbaydzhan, Georgia, Dagestan, Stavropol'skiy kray, the Chechen-Ingush SSR, the All-Union Institute of Experimental Veterinary Science as well as chief veterinarians of rayons and directors of inter-rayon veterinary bacteriological laboratories of the Dagestanskaya ASSR was held in Makhachkal. Twenty-five papers were read, dedicated to the fight against protozoic diseases causing tremendous loss to stock-raising. Of great cognitive and practical value were papers on active immunization of sheep against babesiellosis, read by candidates of veterinary sciences I. M. Ganiyev, A. A. Aliverdiyev and

O. M. Abramova (Dagestan Veterinary Scientific Research Station), I. V. Tsomay (Georgian Veterinary Scientific Research Institute), D. A. Mirzabekov, K. M. Mamedov (Azerbaydzhan Veterinary Scientific Research Institute), who pointed out the possibility to preserve sheep by vaccination. The conference resolved to ask the USSR Ministry of Agriculture Veterinary Administration to undertake commission verification of this method. The problems of decreasing the cost and of simplifying anti-tick treatment of animals constituted the subject of papers by A. A. Aliverdiyev and others. A resolution was taken on these papers to request the USSR Ministery of Agriculture Veterinary Administration to accelerate approval and issue of new units and, in particular, an antenna-relay sprayer of the Dagestan Veterinary Scientific Research Station system.

Of great interest were papers by S. D. Sokolov from Stavropol'skiy Kray on hemosporidiosis of sheep and goats and on measures to combat these diseases, by A. A. Aliyev from Azerbaydzhan, N. V. Matikashvili, A. P. Rostomashvili and others on ways to combat ticks, L. P. D'yakonov, N. I. Stepanov (All-union Veterinary Experimental Institute) on anaplasmosis and on serological methods of diagnosing anaplasmosis of sheep and cattle. We should make particular mention of papers read by professors N. A. Zolotarev and A. A. Markov, as well as by I. V. Abramov, who presented the trend in combatting babesiellosis, pyroplasmosis and other blood-parasitic diseases of livestock. The conference adopted a resolution which noted the imperative tasks for the rapid liquidation of protozoic diseases of livestock in the republic.

Conference on Combatting Zoonotic Diseases by P. K. Gul'yev

An interdepartmental conference was held in Cheboksary on combatting zoonotic diseases. It saw the participation of Chief veterinarians of rayons, directors of interrayon vetbaclabs, epizootologists, veterinary physicians from meat checking stations and packing houses, chief physicians of rayon hospitals and physicians from sanitary-epidemiological stations. The conference was convened by the vice-chairman of the Council of Ministers of the Chuvash ASSR, chairman of the inter-departmental commission for combatting zoonotic diseases, L. I. Astapov.

The conferees heard and discussed the following papers: by Chuvash ASSR Minister of Public Health, V. G. Yefimova -- "Tasks in Fighting TB"; by the director of the Veterinary Administration of the Republic Ministry of Agriculture, A. P. Lavinov -- "Livestock TB Incidence in the Republic and Measures for Combatting it"; by the director of the Republic Veterinary-bacteriological laboratory, Candidate of Veterinary Sciences P. K. Gul'yev -- "Measures for Preventing Anthrax among Livestock in the Chuvash ASSR"; by the director of the department of particularly Dangerous Infections of the Republic Sanitary-epidemiological Station, V. A. Andronikov -- "Preventing Anthrax in Humans" and "Incidence of Brucellosis, Leptospirosis, Tularemia in Humans and Problems of Combatting it"; by the head of the Parasitological Department of the Re-

public Sanitary-epidemiological Station, Z. A. Morozova -- "Work in Eliminating Teniarinhosis in the Chuvash ASSR"; director of Laboratories of the Republic Sanitary-epidemiological Station, G. A. Voronova -- "Human Incidence of Rabies"; Senior Veterinary Physician of the Veterinary Department of the Chuvash ASSR Ministry of Agriculture, M. I. Yashenkov -- "Incidence of Leptospirosis in Livestock and Tasks in Combatting it"; Professor S. N. Pokrovskiy (Rostov-na-Donu) -- "Parasitological Diseases in the RSFSR and the Job of Combatting Them".

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